

# 1 - Expenses & Budget

Content Area: **Mathematics**  
Course(s):  
Time Period: **Marking Period 1**  
Length: **20 Days**  
Status: **Published**

## Summary

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Introduction: Unit 1 will focus on defining types of expenses and developing budgeting skills. Students will analyze how expense definitions can skew a budget either higher or lower, and how that could theoretically impact their ability to invest in other aspects of their lives such as auto, home, and retirement (these topics will be discussed later in the class and will be referred back to the budget created in this unit).

Revision Date: June 2023

## Essential Questions/Enduring Understandings

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Essential Questions:

- What do you need? What do you want?
- What will it cost to get there?
- How can graphs help describe frequency distributions?
- How can past trends predict future occurrences?
- How much will it cost to run the utilities in your home?
- How can you visualize your budget?
- How do you plan for expenses, reduce debt, and grow savings?

Enduring Understanding:

- Determine the mean, median, mode, and outliers of a data set and frequency distribution table.
- Compute and interpret z scores, raw scores, and standard deviation.
- Determine and interpret cumulative and relative frequencies, as well as percentiles.
- Construct scatter plots and determine linear regression models along with its correlation coefficient.
- Compute the cost of utilities and compare energy saving appliances.
- Visualize and interpret a budget using circle graphs, bar graphs, line graphs, and budget line graphs.

- Develop and interpret a cash flow chart, frequency budget plan, and year-long expense budget plan.

## **Objectives**

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Students will know: (content area knowledge)

- How to calculate measures of central tendency.
- How to calculate z scores, raw scores, and percentiles.
- How to differentiate between cumulative and relative frequencies.
- How to construct and interpret scatter plots and linear regression equations.
- How to construct and interpret multiple types of graphs.
- How to calculate the central angle of a circle graph's portions and apply it to calculations.

Students will be skilled at: (skills)

- Applying central tendency values to a group of data.
- Understanding frequency distributions.
- Predict how previous trends affect the future.
- Calculating costs within a home and how this fluctuation affects the budget.
- Visualizing a budget in multiple graph options.

## **Learning Plan**

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- Warm - Up: Students will complete either the warm-up in the textbook for a specific section, or a related problem from the teacher. A timer at the front of the room will maintain timeframes of this activity. When the timer sounds, the students are to hand their work to the teacher for a grade.
- Homework: While the warm-up is being completed, the teacher will walk the room to check homework has been completed. Teacher will check in individually with students who did not fully complete the assignment. Teacher will also take time to ask students with completed assignments if there are specific problems that they would like discussed.
- Discussion: Teacher will go over the warm-up as well as requested homework problems. This will allow time for students to clarify questions on material that has already been covered, and the warm-up gives students a glimpse into the material that will be covered in the new lesson. Teacher will be actively listening during this discussion for signs that students need additional time with previous

information before continuing with the next lesson.

- Lesson: Teacher will lead students through discovering how to apply their prior mathematical knowledge into new content. Students will lead the lesson on how much they remember about the math concept before the application. Once students have a complete knowledge of the concept, teacher will encourage students to apply the concept to the real world situation. Calculations will be completed by students alongside teacher, then within small groups to compare with each other, and finally independently. During the group work time, teacher will circulate the room to listen to each group's discussion of the lesson, monitoring if specific students are struggling and encouraging them. A timer at the front of the room will maintain timeframes of these discussions. During independent work time, teacher will circulate the room to monitor students' progress, especially the aforementioned struggling students.
- Free Work: If time allows, students will be encouraged to spend the rest of the period working on either their homework assignment or progressing on the main project for the unit.

## **Assessment**

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Formative Assessments:

- Prior math concept assessments
- Warm-ups

Summative Assessments:

- Chapter assessments
- Unit assessments
- Unit projects

Benchmark Assessments:

- Informal observations
- Small group observations
- Oral and written explanations of reasoning
- Homework completion

Alternative Assessments

- Group discussions
- Performance tasks

## Materials

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Core instructional materials: [Core Book List](#) including

- Financial Algebra: Advanced Algebra with Financial Applications
- Authored by Robert Gerver, Richard Sgroi

Supplemental materials:

- Financial Algebra website
- Edia website
- Khan Academy website

## Standards

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This unit further reflects the goals of the Holocaust Education mandate where students are able to identify and analyze applicable theories concerning human nature and behavior; understand that genocide is a consequence of prejudice and discrimination; understand that issues of moral dilemma and conscience have a profound impact on life; and understand the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Students will focus on equity, inclusion, and tolerance when analyzing the comparison of various quantities regarding characteristics of people. Equality will also be highlighted which can be associated with both numerical representations and the connection between people. This can be associated with treating people fairly and equality.

CS.K-12.3.a	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CS.K-12.3.b	Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
LA.L.11-12.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.L.11-12.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
LA.L.11-12.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
LA.W.11-12.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
LA.W.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

MA.F-BF.A.1	Write a function that describes a relationship between two quantities.
MA.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
MA.F-IF.A.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If $f$ is a function and $x$ is an element of its domain, then $f(x)$ denotes the output of $f$ corresponding to the input $x$ . The graph of $f$ is the graph of the equation $y = f(x)$ .
MA.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
MA.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
MA.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
MA.F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.
MA.F-LE.A.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
MA.S-IC.A.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
MA.S-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
MA.S-IC.B.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
MA.S-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
MA.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
MA.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
MA.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
MA.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
MA.S-ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.
MA.S-ID.C.9	Distinguish between correlation and causation.
MA.S-MD.B.5	Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
WRK.9.2.12.CAP.5	Assess and modify a personal plan to support current interests and post-secondary plans.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.13	Analyze how the economic, social, and political conditions of a time period can affect the labor market.

**Integrated Accommodation and Modifications, Special Education students, English Language Learners, At-Risk students, Gifted and Talented students, Career Education, and those with 504s**

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